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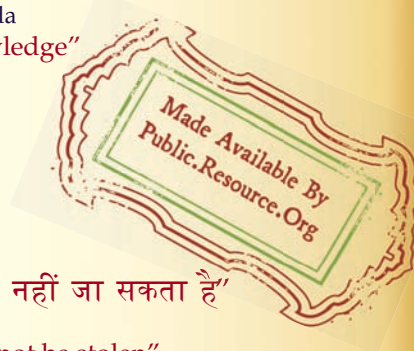
IS 2161 (1996): Coolant pumps for general purpose machine tools [PGD 2: Machine Tool Elements and Holding Devices]



“ज्ञान से एक नये भारत का निर्माण”

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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
सामान्य प्रयोजन के मशीनी औज़ारों के लिए
शीतक पम्प — विशिष्टि
(पहला पुनरीक्षण)

Indian Standard
COOLANT PUMPS FOR GENERAL PURPOSE
MACHINE TOOLS — SPECIFICATION
(*First Revision*)

ICS 23.080;21.260

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Machine Tool Elements and Holding Devices Sectional Committee had been approved by the Production Engineering Division Council.

This standard was first issued in 1962. The present revision of the standard has been taken up to bring the standard in line with current manufacturing practices. The main modifications are as follows:

- a) The 'table' on arrangement of terminal box on coolant pump has been thoroughly revised.
- b) The nominal capacity in litres/min has been used to specify the size of the pump. Capacities up to 250 litres/min have been covered. The kW ratings have also been included along with discharge characteristics curves.

While preparing this standard, considerable assistance has been derived from IMTMAS-13 : 1990 'Specification for coolant pumps for general purpose machine tools'.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

COOLANT PUMPS FOR GENERAL PURPOSE MACHINE TOOLS — SPECIFICATION (First Revision)

1 SCOPE

This standard covers the dimensions and other requirements of coolant pumps for general purpose machine tools.

2 REFERENCES

2.1 The following standards contain provisions, which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
210 : 1993	Grey iron castings (<i>fourth revision</i>)
325 : 1978	Three phase induction motors (<i>fourth revision</i>)
554 : 1985	Dimensions for pipe threads where pressure tight joints are required on the threads (<i>third revision</i>)
778 : 1984	Copper alloy gate, globe and check valves for water works purposes (<i>fourth revision</i>)
1260 (Part 2) : 1979	Pictorial marking for handling and labelling of goods : Part 2 General goods (<i>second revision</i>)
1271 : 1985	Thermal evaluation and classification of electrical insulation (<i>first revision</i>)
1879 : 1987	Malleable cast iron pipe fittings (<i>second revision</i>)
3043 : 1987	Code of practice for earthing
3624 : 1987	Pressure and vacuum gauges (<i>second revision</i>)
4691 : 1985	Degrees of protection provided by enclosures for rotating electrical machinery (<i>first revision</i>)
6098 : 1971	Methods of measurement of the airborne noise emitted by rotating electrical machinery
9537 (Part 2) : 1981	Conduits for electrical installations : Part 2 Rigid steel conduits

3 DIMENSIONS

3.1 The nominal capacity and dimensions of coolant pumps shall be as given in Table 1.

4 MATERIALS

4.1 Pump casting should conform to Grade 20 of IS 210 : 1993 and free from defects like blow holes and porosity.

5 GENERAL REQUIREMENTS

5.1 Performance of coolant pump motor shall generally conform to IS 325 : 1978.

5.2 The type of insulation in motor shall be minimum class 'B' as per IS 1271 : 1985.

5.3 Insulation resistance should not be less than 1 mega ohm when measured with a DC voltage of 500 V.

5.4 The type of enclosure of the motor shall be IP 44 and for terminal box and its cover shall be IP 54 as per IS 4691 : 1985.

5.5 Coolant pump motor should be suitable for ambient temperature up to 45°C.

5.6 Noise level of the coolant pump shall not exceed 75 dBA (sound pressure level) and shall be measured as per IS 6098 : 1971.

5.7 Gaskets for terminal box to be provided to prevent entry of coolant/dust.

5.8 Position of conduit entry to be adjustable through every 90° by rotating the terminal box.

5.9 Relative position of terminal box to coolant outlet to be adjustable through every 90° by turning the terminal box (*see* Table 2). The conduit entry shall be 16 as per IS 9537 (Part 2) : 1981.

5.10 If the pumps are intended for mediums other than water soluble coolants and for different operating conditions, the manufacturers should be consulted.

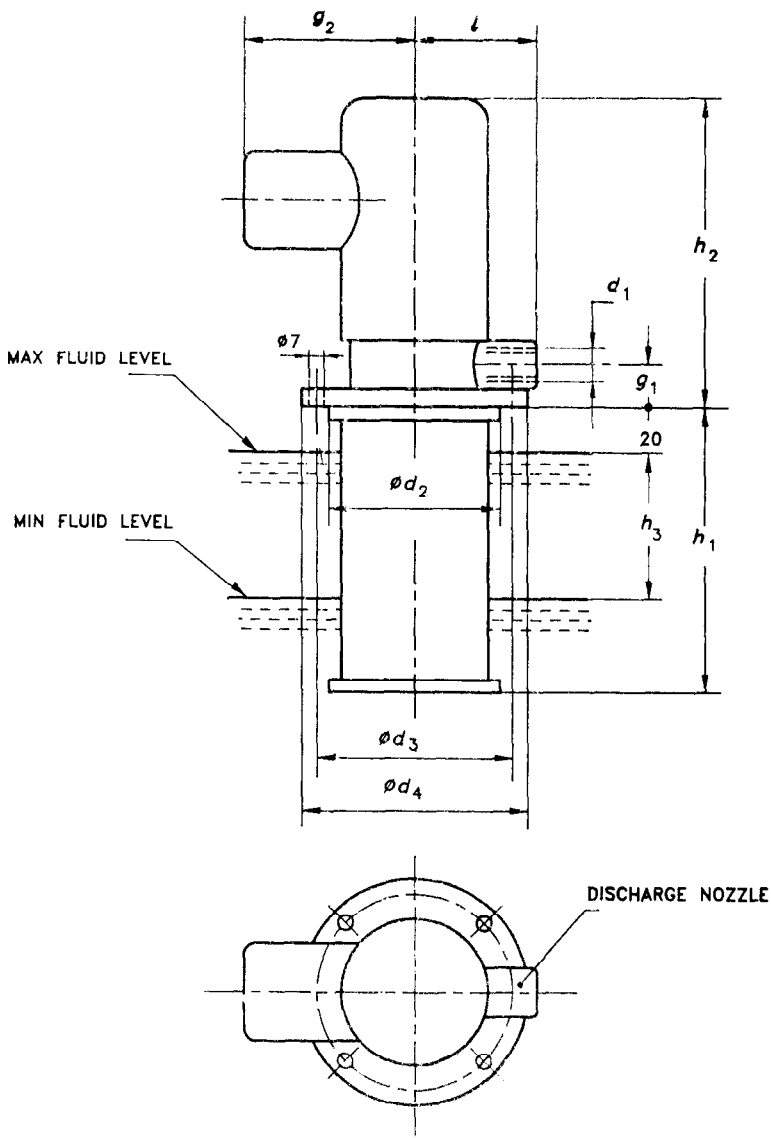
5.11 Unless specified otherwise by the purchaser and agreed upon by the supplier, the coolant pump motor conforming to this standard shall be suitable for working on 415 V, 3 Phase, 50 Hz supply and the terminal box arrangement as 1 of Table 2. Earthing of the motor shall be done in accordance with the relevant provisions of IS 3043 : 1987.

5.12 Care shall be taken that sufficient space is available between the bottom of the pump and the tank.

Table 1 Nominal Capacity and Dimensions for Coolant Pumps

(Clause 3.1)

All dimensions in millimetres.



Nominal Capacity l pm ±15 Percent	h_1 Sub-merged Depth	d_1	d_2 0 -1	d_3 ±0.2	d_4	l ±2	g_1 ±2	g_2 Max	h_2 Max	h_3	kW Max	Minimum Total Head at No Flow
25	120	R $\frac{3}{4}$	100	115	130	70	30	130	190	30	0.12	4
	170									80		
40	170	R $\frac{3}{4}$	100	115	130	70	30	130	190	80	0.18	5
	220									130		
63	220	R $\frac{3}{4}$	100	115	130	70	30	130	200	130	0.25	6
100	220	R 1	140	160	180	100	32	150	280	130	0.37	8
	270									180		
160	220	R 1	140	160	180	100	32	150	280	130	0.75	10
	270									180		
	350									260		
250	270	R 1 $\frac{1}{4}$	140	160	180	100	32	150	280	180	1.1	15
	350									260		
	440									350		

NOTES

- 1 Capacity and dimensions are based on motor for 3 000 rpm (synchronous) at 50 Hz.
- 2 The capacity data in the table relate to water with a kinematic viscosity of 1 sq mm/s at a total head of 2 m. More precise capacity data can be obtained from the manufacturer's documentation.
- 3 Threads conforming to IS 554 : 1985 to be used where pressure tight joints are required on the threads.

6 TESTS

The coolant pump shall be tested as given in Annex A.

7 DESIGNATION

A coolant pump shall be designated by name, nominal capacity, submerged depth and IS No.

Example:

A coolant pump having nominal capacity 63 litres/min, and submerged depth $h_1 = 220$ mm, and conforming to this standard shall be designated as:

COOLANT PUMP IS 2161 63 — 220

NOTE — Other parameters like terminal box arrangement, rated voltage, phase, rated frequency, etc, shall be supplied along with the coolant pump.

8 MARKING

8.1 Pump shall be marked clearly with designation, manufacturers' name or trade-mark on the casting at 45° CW of the discharge nozzle, either moulded or on aluminium anodized index plate.

8.2 BIS Certification Marking

The product may also be marked with Standard Mark.

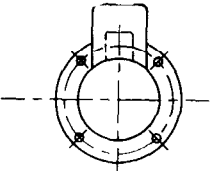
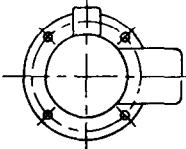
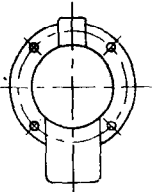
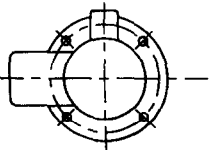
8.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

9 PACKING

The coolant pump shall be packed in wooden box with suitable cushioning to take care of shock, vibration and possible damage during transport and handling. The box shall be suitably marked as per IS 1260 (Part 2) : 1979. Care should be taken to pack the terminal box suitable to avoid damage in transit.

Packing for despatch through lorry carriers/public transporting system should be as requested by the customer.

Table 2 Arrangement of Terminal Box on Coolant Pump
(Clauses 5.9 and 5.11)

Arrangement	Viewed on the Motor	Location of Terminal Box
1		At 0° that is on the same side as discharge nozzle
2		At 90° clockwise (CW) of the discharge nozzle
3		At 180° on the opposite side of the discharge nozzle
4		At 90° counter — clockwise (CCW) of the discharge nozzle

ANNEX A*(Clause 6)***PERFORMANCE TESTS OF COOLANT PUMPS**

The coolant pump shall be tested for discharge characteristics as described below:

1. Prepare the test set up as given in Fig. 1:

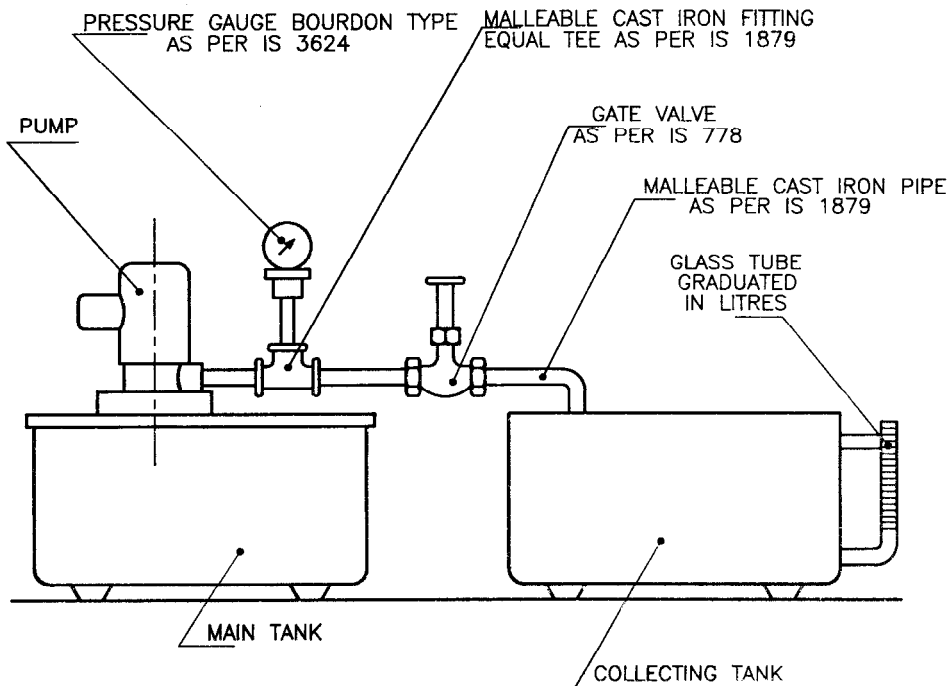


FIG. 1 TEST SET UP FOR CHECKING PUMP DISCHARGE CHARACTERISTICS

2. Run the pump and set the gate valve such that the pump continues to pump water from main tank to the collecting tank at various readings as indicated by the pressure gauge of appropriate range. Measure and record the heads corresponding discharge rates. Plot the "discharge vs head" characteristics of the pump. (Representative characteristics are given in Fig. 2).

Typical discharge characteristics of pumps with 6 different capacities with standard fluid as water.

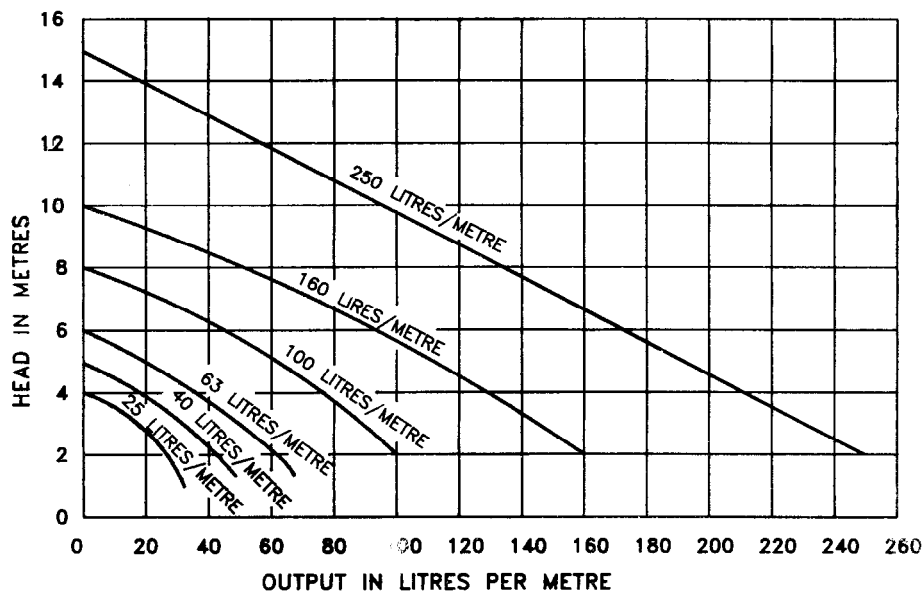


FIG. 2 CAPACITY CHART

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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